

# 2016 HIGHLIGHTS REPORT

**TVA ENERGYRIGHT® SOLUTIONS**

ENERGY EFFICIENCY • CUSTOMER SYSTEMS • RENEWABLE ENERGY

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# EXECUTIVE MESSAGE

## LOOK WHAT WE ACCOMPLISHED TOGETHER

Nine consecutive years of meeting or exceeding performance targets for energy efficiency and renewable solutions – **nine consecutive years!**

That is what TVA, in partnership with TVPPA, local power companies and directly served customers, have been able to accomplish by working together and striving to improve the quality of life for people in the Tennessee Valley.

In 2016, we were able to continue this success by doing great things through the EnergyRight® Solutions program. With our partners' help, the Valley saved 381 GWh in energy efficiency (enough energy to power 24,600 homes). EnergyRight Solutions for the Home saw over \$106 million in homeowner investments for energy efficiency measures. EnergyRight Solutions for Industry achieved 100 percent of their fiscal year goal while EnergyRight Solutions for Business achieved 143 percent of their goal. Renewable Energy Solutions installed over 400 new installations

accounting for over 20 MW of power, plus sold over 185,000 MWh to approximately 12,000 residential and commercial customers.

These are just a few of the accomplishments that made 2016 a great year for energy efficiency, demand response and renewable energy.

The EnergyRight Solutions team will strive to continue these successes and serve the people of the Tennessee Valley not just because these are wise business decisions and a part of our mission but, as always, **it's the right thing to do!**

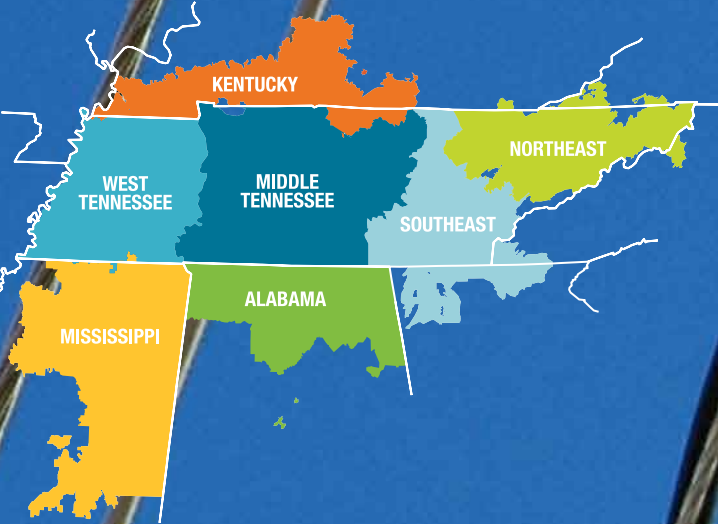


Sincerely,  
*Cynthia L. Herron*  
Cynthia L. Herron  
Vice President  
EnergyRight® Solutions



# POWERFUL PARTNERSHIPS

TVA would like to thank our local power company (LPC) partners and directly served customers, the Tennessee Valley Public Power Association Inc. (TVPPA), Seven States Power Corporation and the Tennessee Valley Industrial Committee (TVIC) for being an integral part of delivering EnergyRight Solutions (ERS) to people across the Valley. These programs would not be possible without the participation and partnership of these groups.





# SUCCESS STORIES

Across the region, homeowners, businesses, industry and local power companies have put EnergyRight Solutions principles into practice with impressive results. These are some of their stories:

- Glasgow EPB Smart Energy Technology
- North Georgia EMC Extreme Energy Makeover
- Tri-Cities Airport
- World's Fair Holiday Inn
- E.M. Heard & Sons Farm
- Orbital ATK
- Metropolitan Nashville Airport Authority
- Westlake Chemical
- University of Tennessee Knoxville
- Chattanooga Electric Carshare Program





EnergyRight Solutions for the Home Success Story

# GLASGOW EPB HELPS HUNDREDS OF KENTUCKY HOMES RECEIVE SMART TECHNOLOGY

Glasgow Electric Plant Board (GEPB) in Kentucky, in partnership with TVA’s EnergyRight® Solutions, celebrated a milestone this past year as it announced its Glasgow Smart Energy Technology project (GSET) completed 330 high efficiency homes in just over a year.

In a partnership between TVA, GEPB, Move the Peak, the University of Louisville, Virtual Peaker, Strata-G and other technology vendors, Smart Communities GSET project homes were retrofitted with a variety of advanced energy efficiency measures, such as home weatherization, smart thermostats, heat pump water heaters and storage battery technology. The networked technologies allow Glasgow customers to maximize the benefits of Glasgow’s smart grid, while also providing improved load factor benefits to both TVA and GEPB.



GEPB employee demonstrates how to use a high efficiency heat pump water heater.



EnergyRight Solutions for the Home Success Story

**EXTREME ENERGY  
MAKEOVER MAKES A  
REAL DIFFERENCE IN  
NORTH GEORGIA**

Conserving energy and saving money came a little easier to North Georgia Electric Membership Corporation (NGEMC) customers who participated in the Extreme Energy Makeover project offered in partnership with TVA. NGEMC received \$1.4 million for their Extreme Energy Makeover project which provides whole-home energy efficiency retrofits for income-qualified participants. The project targets 25 percent electric energy savings in homes at least 20 years old at an all-in cost of approximately \$10 per square foot.



Eddie Dyer, a TVA-certified energy advisor, explains how a more efficient heat pump water heater can help homeowners save money each month when compared to a standard water heater.





EnergyRight Solutions for Business + Industry Success Story

# TRI-CITIES AIRPORT INSTALLS ALL-ELECTRIC GROUND SERVICE EQUIPMENT

Tri-Cities Airport, in partnership with TVA’s EnergyRight Solutions and Bristol Tennessee Essential Services, was able to purchase electric ground service equipment (GSE), including a belt loader and baggage tractor. The rechargeable, electric-powered GSE replaces gas-powered equipment and will result in emission reductions of approximately 64 tons of CO<sub>2</sub> annually at the airport. The goal of the project is to reduce emissions, enhance environmental benefits, and improve commercial and industrial customer operations.

64 metric tons

ANNUAL CO<sub>2</sub> REDUCTION







EnergyRight Solutions for Business + Industry Success Story

# ENERGY MAKEOVER BRINGS CUTTING-EDGE TECH TO WORLD’S FAIR HOLIDAY INN

TVA’s EnergyRight Solutions for Business + Industry, in partnership with Knoxville Utilities Board, the World’s Fair Holiday Inn and facility solutions provider Perfection Group Inc., added cutting edge technology to the hotel to help save on energy. Some of this technology includes variable-frequency drives on the hotel’s pumps and fans, a new scheduling system to look at outdoor air temperatures to see if air can be pulled into the hotel for AC use and a system that monitors occupancy schedules with the ability to turn off ventilation in rooms not being used.

557,079 kWh

ENERGY SAVINGS







EnergyRight Solutions for Business + Industry Success Story

# PROVIDING CREATIVE SOLUTIONS TO UNIQUE FARMING PROBLEMS AT E.M. HEARD & SONS FARM

E.M. Heard & Sons Farm, a pig farm in Auburn, Kentucky, had been seeking a solution for years for the problem of piglets being crushed when they clumped too close to the sow for body heat. To cut down on that loss and decrease energy usage, Warren Rural Electric Cooperative Corporation partnered with TVA and PPN member Cape Electrical Supply to provide Kane heating pads. These pads provided evenly distributed warmth and plenty of room for the piglets.

“Not only do the mats save piglets, we also save a tremendous amount on our energy cost,” explained Eric Heard, co-owner of the farm. “The mats have more than paid for themselves.”

**225,000 kWh**

**ANNUAL ENERGY SAVINGS**







EnergyRight Solutions for Business + Industry Success Story

# ORBITAL ATK ACHIEVES WORLD-CLASS ENERGY SAVINGS WITH NEW LIGHTING

Orbital ATK, a global leader in aerospace and defense technology, worked with Abaco Lighting, an ERSB+I Preferred Partner Network member, to upgrade lighting at their luka, Mississippi, manufacturing facility. The lighting upgrades improved production quality, employee comfort and safety benefits. Plus, their overall electricity cost went down approximately 20 percent.

“Utilizing a certified TVA PPN member made the installation of the project go very smoothly,” said Jeff Maxwell, operations manager of Abaco Lighting.

840,000 kWh

ANNUAL SAVINGS







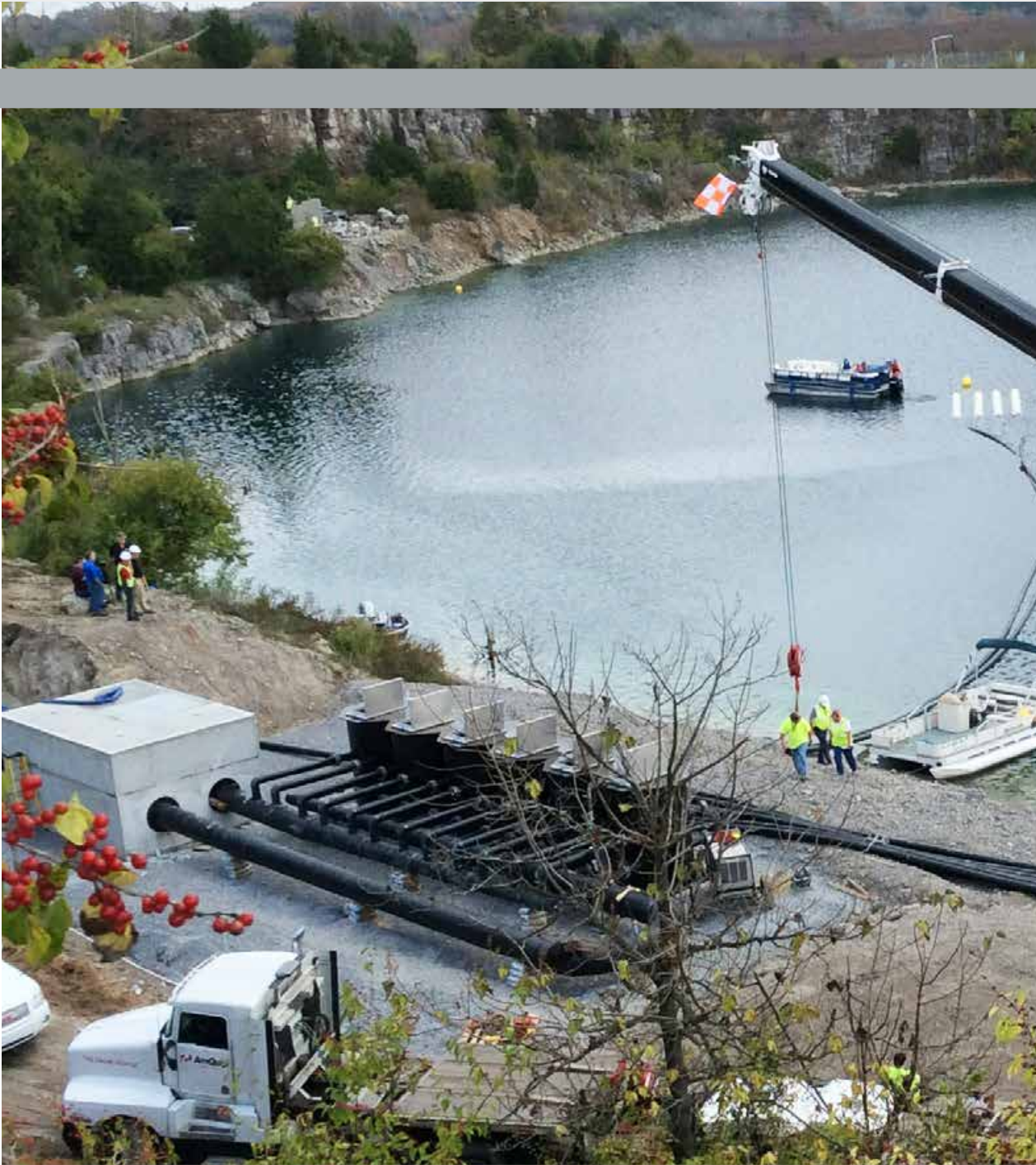
EnergyRight Solutions for Business + Industry Success Story

# METROPOLITAN NASHVILLE AIRPORT AUTHORITY ADDS GEOTHERMAL SYSTEM

The Metropolitan Nashville Airport Authority (MNA), in partnership with Nashville Electric Service, participated in the EnergyRight Solutions for Business + Industry program to complete the installation of the largest lake plate geothermal system in North America. The geothermal system will provide an estimated energy savings of 3,595,092 kilowatt-hours per year and increase sustainability for the future of MNA.

**3.6 million kWh**

**ESTIMATED SAVINGS PER YEAR**







Industrial Marketing and Services Success Story

# WESTLAKE CHEMICAL EQUIPMENT UPGRADE

Westlake Chemical Corporation’s location in Calvert City, Kentucky, specializes in the creation of key materials such as vinyl resin that are used in the creation of products such as PVC siding, PVC decking, window profiles, and vinyl films. This facility recently underwent major process improvements by converting the plant from propane to low-cost ethane feedstock. By installing new, more energy efficient equipment such as a compressor motor and other substantial modifications, Westlake is not only making wise energy choices but is also partnering with TVA to make lasting economic strides for western Kentucky.

Bob Buesinger, senior vice president of vinyls, expressed his satisfaction with the project’s success, stating, “With TVA as a partner through the EnergyRight Program, Westlake Chemical’s Calvert City, Kentucky, complex has continued to expand total vinyl products output and improve feedstock utilization. At the same time, we have increased overall energy efficiency and helped to secure over 500 western Kentucky jobs. Westlake appreciates the long-term commitment TVA is making to the Valley industrial base.”

## 73 million kWh

EXPECTED ANNUAL ENERGY SAVINGS







Renewable Energy Solutions Success Story

# UNIVERSITY OF TENNESSEE KNOXVILLE CONTINUES TO GO GREEN!

The University of Tennessee’s Knoxville (UTK) campus was recently ranked No. 1 in the nation on the EPA’s list of universities purchasing green power. UTK purchases 50,000 MWhs from TVA’s Green Power Switch Southeastern RECs program each year. Congratulations to UTK on the impressive No. 1 ranking!

50,000 MWh

PURCHASED GREEN POWER

=

7,400

CARS REMOVED FROM THE ROAD EACH YEAR

OR

33,000

PLANTED ACRES OF TREES







Renewable Energy Solutions Success Story

# CHATTANOOGA INTRODUCES ELECTRIC CARSHARE PROGRAM POWERED BY SOLAR

In 2016, TVA, the Chattanooga Area Regional Transportation Authority (CARTA) and Chattanooga EPB partnered to make Chattanooga one of the first cities in the nation with an electric vehicle carshare program. Twenty Nissan Leafs are stationed at various parking locations in and around the city to provide drivers all-electric vehicles to rent by the hour through a smart phone app. Solar panels were installed through the Green Power Providers program to ensure clean power was generated to power the battery-powered vehicles.

“The electric vehicle car-share program will reduce air pollution and traffic congestion and offer a safe, environmentally friendly alternative to owning a car,” said CARTA Executive Director Lisa Maragnano.



# HIGHLIGHTS OF 2016

Having a competitive position within our power system and resource planning models makes ERS a least-cost option. This enables us to reduce load and offset the possible need for additional resources.

381.4 GWh

FY16 ERS ACHIEVEMENT

The Valley has exceeded its load management targets nine years in a row.

28 MW (DC)

RENEWABLES INSTALLED FY16

185,120 MWh

SOLD THROUGH REC PROGRAMS IN FY16

\$790 million

CAPITAL AVOIDANCE AT \$700 PER  
KILOWATT OF INSTALLED COSTS

2.0¢ per kWh

AVERAGE LIFETIME COSTS FOR TVA'S  
ENERGY EFFICIENCY PROGRAMS

1,128 MW

AVOIDED CAPACITY ADDITION

>3,120 GWh

ENERGY NEEDS AVOIDED

Savings of EnergyRight Solutions programs from 2008 to 2016.





# ENERGYRIGHT SOLUTIONS FOR THE HOME

EnergyRight Solutions for the Home offers a variety of programs to help customers save energy and money. Programs include:

- eScore™ Program
- eScore™ Self Audit Program
- Heat Pump Program
- New Homes Program
- Volume Heat Pump Program for Manufactured Homes
- ENERGY STAR® Pilot Program for Manufactured Homes



# eSCORE PROGRAM

The eScore™ program is designed to provide homeowners a simple path to making their home a “10” – its most energy efficient. Homeowners work toward an energy efficiency score for their home at their own pace, earning rebates on qualified upgrades performed by Quality Contractor Network (QCN) members, and re-engaging with the program as many times as needed to achieve their home’s best possible energy performance. Financing is available in most areas to help homeowners make upgrades.

23,884

PROGRAM PARTICIPANTS

26.84 GWh

ENERGY SAVED

More than 18,400 evaluations and inspections performed during FY16 with more than 23,000 homeowners making improvements.

### TOP PERFORMERS

Middle Tennessee Electric Membership Corporation	1,978,130 kWh
Nashville Electric Service	1,942,765 kWh
Electric Power Board of Chattanooga	1,763,614 kWh
Volunteer Energy Cooperative	1,302,955 kWh
Appalachian Electric Cooperative	1,183,285 kWh

### TOP SAVINGS, PERCENT OF SALES

Appalachian Electric Cooperative	0.20%
McMinnville Electric System	0.18%
Scottsboro Electric Power Board	0.15%
Caney Fork Electric Cooperative Inc.	0.14%
Blue Ridge Mountain Electric Membership Corporation	0.12%





# eSCORE SELF AUDIT PROGRAM

eScore™ Self Audit is a do-it-yourself online program that allows residential customers to input information about their home and receive a personalized report with energy efficiency recommendations. Customers completing an audit may then participate in the eScore program and receive rebates for energy efficiency upgrades. First-time participants also receive an energy efficiency starter kit.

13,574

PARTICIPANTS

9.87 GWh

ENERGY SAVED

TOP PERFORMERS

Memphis Light, Gas & Water Division	1,013,077 kWh
Electric Power Board of Chattanooga	928,928 kWh
Nashville Electric Service	720,720 kWh
Knoxville Utilities Board	687,960 kWh
Appalachian Electric Cooperative	489,216 kWh

TOP SAVINGS, PERCENT OF SALES

Amory Water & Electric	0.14%
Appalachian Electric Cooperative	0.08%
Sweetwater Utilities Board	0.07%
City of Dayton Electric Department	0.06%
City of West Point Electric System	0.06%

More than 200,000 homeowners have received a kit since the promotion began in 2008.





# HEAT PUMP PROGRAM

One of TVA's longest running efficiency programs, the Heat Pump Program promotes the installation of high-efficiency heat pumps in homes and small businesses by offering incentives to local power companies for installations. TVA fosters a Quality Contractor Network (QCN) to maintain high installation standards. Financing is available in most areas to help homeowners make upgrades.

2,116

INSTALLATIONS

4.05 GWh

ENERGY SAVED

TOP PERFORMERS

Blue Ridge Mountain Electric Membership Corporation	399,154 kWh
Sevier County Electric System	371,070 kWh
North Georgia Electric Membership Corporation	298,809 kWh
Joe Wheeler Electric Membership Corporation	261,702 kWh
Scottsboro Electric Power Board	198,814 kWh

TOP SAVINGS, PERCENT OF SALES

Scottsboro Electric Power Board	0.21%
Fort Payne Improvement Authority	0.14%
Blue Ridge Mountain Electric Membership Corporation	0.10%
Sevier County Electric System	0.07%
Alcorn County Electric Power Association	0.05%





# NEW HOMES PROGRAM

Energy efficient new homes built to TVA’s standards not only save homeowners money on their energy bill each month and provide increased comfort, but may also be eligible for incentives from TVA and local power companies. Builders participating in the program find it flexible since they may achieve energy efficiency at three levels: EnergyRight, EnergyRight Platinum and EnergyRight Platinum Certified. Additional incentives are available for installing an advanced water heater.

2,346

NEW HOMES INCENTIVIZED

TOP PERFORMERS	
Huntsville Utilities	4,248,703 kWh
Electric Power Board of Chattanooga	489,175 kWh
City of Florence Electricity Department	484,140 kWh
Middle Tennessee Electric Membership Corporation	268,686 kWh
Sevier County Electric System	232,254 kWh

8.29 GWh

ENERGY SAVED

TOP SAVINGS, PERCENT OF SALES	
Tuscumbia Electricity Department	0.34%
Huntsville Utilities	0.18%
Muscle Shoals Electric Board	0.11%
Loudon Utilities	0.09%
Franklin Electric Plant Board	0.08%

Alabama was the top performing district with 1,283 new homes. Over 73 percent of all new homes in the Alabama program were built in the Huntsville area.





# VOLUME HEAT PUMP PROGRAM FOR MANUFACTURED HOMES

TVA’s Volume Heat Pump Program for Manufactured Homes promotes the installation of electric heat pumps in qualified manufactured homes. This program is administered through a network of HVAC wholesalers. Those wholesalers are incentivized for selling properly sized heat pumps in lieu of central air conditioning units. This allows homeowners to not only have efficient air conditioning, but save on their heating costs as well.

2,734

HEAT PUMPS INSTALLED

8.43 GWh

ENERGY SAVED

### TOP PERFORMERS

Volunteer Energy Cooperative	521,365 kWh
Knoxville Utilities Board	379,455 kWh
Appalachian Electric Cooperative	274,565 kWh
Tombigbee Electric Power Association	225,205 kWh
Holston Electric Cooperative	209,780 kWh

### TOP SAVINGS, PERCENT OF SALES

Sparta Electric & Public Works	0.09%
Plateau Electric Cooperative	0.07%
Sweetwater Utilities Board	0.06%
Holston Electric Cooperative	0.06%
Jellico Electric and Water Systems	0.06%



# ENERGY STAR PILOT PROGRAM FOR MANUFACTURED HOMES

Through incentives paid to manufactured homes producers, TVA is helping to offset the cost of building ENERGY STAR qualified manufactured homes to be sited in the Valley with an electric heat pump. ENERGY STAR manufactured homes with a heat pump will lower home electric bills by \$50-\$70 per month, providing thousands of dollars in savings over the life of the home.

1,630

ENERGY STAR  
MANUFACTURED HOMES

19.70 GWh

ENERGY SAVED







# QUALITY CONTRACTOR NETWORK (QCN)

The QCN, a group of highly skilled and knowledgeable contractors, helps ensure that homeowners’ energy efficiency upgrades are installed correctly, provides service down the road and even coordinates financing through the local power company. The QCN is integral to the eScore and Heat Pump programs.

15,459

eSCORE INSPECTIONS IN FY16

\$5.45 million

IN CUSTOMER SPENDING THROUGH eSCORE IN FY16

84%

PARTICIPANTS ENTERING eSCORE PROGRAM THROUGH CONTRACTOR PATH

4.6 out of 5

CUSTOMER SATISFACTION WITH QCN





# ENERGYRIGHT SOLUTIONS FOR BUSINESS + INDUSTRY

EnergyRight Solutions for Business + Industry (ERSB-I) provides assessments of energy use and incentives for qualifying businesses and industries that can reduce their electricity usage. In this section:

- ERSB GWh Saved
- ERSB Incentives Paid
- ERSI GWh Saved
- ERSI Incentives Paid
- Preferred Partners Network (PPN)



# ERSB GWh SAVED

EnergyRight Solutions for Business helps businesses use energy wisely by providing assessments of energy use and incentives for qualifying businesses.

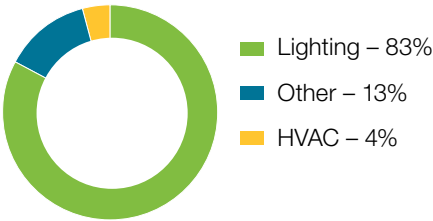
152.42 GWh

ENERGY SAVED

45.79 GWh

AMOUNT EXCEEDED GOAL FOR ERSB

### TOP MEASURES IMPLEMENTED



### TOP PERFORMERS

Memphis Light, Gas & Water Division	26,015,925 kWh
Nashville Electric Service	14,309,348 kWh
Middle Tennessee Electric Membership Corporation	12,249,955 kWh
Murfreesboro Electric Department	10,591,839 kWh
Knoxville Utilities Board	8,322,856 kWh

### TOP SAVINGS, PERCENT OF SALES

Hickman Electric Plant Board	4.45%
Fulton Electric System	3.23%
Etowah Utilities	1.41%
City of Water Valley Electric Department	1.39%
Aberdeen Electric Department	1.38%



# ERSB INCENTIVES PAID

\$9.88 million

INCENTIVES PAID TO BUSINESS CUSTOMERS

148 LOCAL POWER COMPANY PARTICIPANTS ACTIVE IN FY16

## TOP BUSINESS PROGRAM PARTICIPANTS

Retail Trade	45%
Educational Services	10%
Food Services	9%
Transportation and Warehousing	1%
Agriculture	2%
Real Estate	4%
Health Care	3%
Finance and Insurance	2%
Other Services	24%



## ENERGY SAVINGS BY DISTRICT

- AL – 13%
- KY – 5%
- MS – 8%
- MID TN – 34%
- NE – 13%
- SE – 6%
- WEST TN – 21%





# ERSI GWh SAVED

The industrial sector alone accounts for about one-third of U.S. energy use. Customized TVA technical assistance is available to industrial users of power to devise plantwide, holistic approaches to using energy wisely. TVA helps customers maximize efficiency, control expenses and boost their bottom lines.

114.29 GWh

## ENERGY SAVED



### TOP MEASURES IMPLEMENTED

- Lighting – 85%
- Compressed Air – 6%
- Variable Frequency Drives – 4%
- All Others – 5%

### TOP PERFORMERS

Electric Power Board of Chattanooga	3.99 GWh
Alcorn County Electric Power Association	3.32 GWh
Memphis Light, Gas & Water Division	3.00 GWh
Warren Rural Electric Cooperative Corporation	2.54 GWh
Nashville Electric Service	1.83 GWh

### TOP SAVINGS, PERCENT OF SALES

Trenton Light & Water Department	5.43%
Tennessee Valley Electric Cooperative	5.31%
Holly Springs Electric Department	3.67%
Marshall-DeKalb Electric Cooperative	3.13%
Powell Valley Electric Cooperative	3.06%

Directly served customers reduced energy 71.60 GWh, or 63 percent of the total 114.29 GWh saved.





# ERSI INCENTIVES PAID

\$9.6 million

INCENTIVES PAID TO INDUSTRIAL CUSTOMERS

## TOP INDUSTRIAL PROGRAM PARTICIPANTS

Paper Mills	13%
Plastic Materials and Resins	17%
Primary Metals	35%
Motor Vehicles and Passenger Car Bodies	7%
Nonwoven Fabrics	4%
Other	24%

\$6.5 million went to directly served customers and \$3.1 million to LPC-served customers.



ENERGY SAVINGS BY DISTRICT

- AL – 4%
- KY – 32%
- MS – 41%
- MID TN – 9%
- NE – 4%
- SE – 5%
- WEST TN – 5%







# PREFERRED PARTNERS NETWORK (PPN)

TVA’s PPN is a network of general contractors, architects, engineers and trade allies who are experts in their field, and have training and insight into the ERSB+I programs.

266.71 GWh

SAVED BY ERSB+I PROGRAMS

97%

OF PROJECTS WERE BY PPN MEMBERS

176.7 GWh

SAVED BY PPN MEMBERS

414

TOTAL PPN MEMBERS AS OF SEPT. 30, 2016





# INDUSTRIAL MARKETING

Customer satisfaction and relationship management are the cornerstones of Industrial Marketing’s strategy. They are focused on strengthening customer relationships, offering competitive pricing products, capitalizing on opportunities to better manage TVA’s load and implementing creative economic development programs.



# INDUSTRIAL MARKETING

## DIRECTLY SERVED TOP PERFORMERS

Resolute Forest Products	37.1 GWh
Westlake Chemical Company (final phase)	29.5 GWh
Logan Aluminum	2.6 GWh







# ENERGYRIGHT SOLUTIONS FOR CUSTOMER SYSTEMS

The energy business is a balance of power demand and generation. New systems of demand monitoring and response add megawatts to the balance, not by building brick and mortar power generation plants, but by using “virtual power plants” to lower power consumption.



# ENERGYRIGHT SOLUTIONS FOR CUSTOMER SYSTEMS

EnergyRight Solutions for Customer Systems delivers a demand response portfolio to help TVA manage peak power demand. These programs range from voltage control to load curtailment.

## TOP PERFORMERS (NEW DEMAND RESPONSE – ENERNOC)

Franklin Electric Plant Board	3,240 kW
Loudon Utilities	1,980 kW
Upper Cumberland Electric Membership Corporation	1,245 kW
Greeneville Light & Power System	1,135 kW
Aberdeen Electric Department	875 kW

## TOP PERFORMERS (CONSERVATION VOLTAGE REGULATION)

Duck River Electric Membership Corporation	16,855,000 kWh
Scottsboro Electric Power Board	935,000 kWh







# RENEWABLE ENERGY SOLUTIONS

Renewable energy in the form of wind, solar, low-impact hydro and biomass is contributing significant generation to the TVA service area. These programs are adding to the mix:

- Green Power Switch®
- Green Power Switch® Southeastern RECs
- Green Power Providers™
- Renewable Standard Offer and Solar Solutions Initiative
- Distributed Solar Solutions



# GREEN POWER SWITCH

Green Power Switch offers a simple way for consumers to support renewable energy sources such as wind, solar, low-impact hydro and biomass. Each \$4 purchase ensures a block of 150 kilowatt-hours of renewable energy is delivered to TVA’s electricity mix.

1,017,092 MWh

RENEWABLE GENERATION PROGRAM-TO-DATE

TOP PERFORMERS	MWh SOLD
Nashville Electric Service	10,415
Knoxville Utilities Board	9,382
Memphis Light, Gas & Water Division	7,551
Murfreesboro Electric Department	6,078
Huntsville Utilities	4,467

Since the program began, GPS customers have supported enough megawatt-hours of renewable power to supply the annual electricity needs for more than 70,500 average homes in the TVA service area.

12,129

CUSTOMERS

68,883

MWh SOLD FOR FY16





# GREEN POWER SWITCH SOUTHEASTERN RECS

Green Power Switch Southeastern RECs is a bulk purchase option for businesses in the Valley. It gives an orgnaiztion the ability to make renewable energy claims, and allows them to demonstrate to their customers and stakeholders that they support regional green initiatives. This option is a pilot program only available in a limited number of local power company regions.

116,237 MWh

MWh SOLD FOR FY16

12

CUSTOMERS





# GREEN POWER PROVIDERS

Green Power Providers incentivizes Valley homeowners and businesses to install and operate their own renewable energy systems.

2,945

PARTNER INSTALLATIONS  
PROGRAM-TO-DATE

100.05 MW

RENEWABLE GENERATION DC NAMEPLATE  
CAPACITY PROGRAM-TO-DATE

RESOURCE	OPERATING MW – DC NAMEPLATE
Solar	88.75
Biomass (landfill gas and wastewater methane)	11.168
Wind	0.12
Hydroelectric	0.009
Total Operating	100.05

Another 169 projects, representing nearly 4.16 MW (DC) of additional power, were approved by TVA and were in various stages of construction as of Sept. 30, 2016.





# RENEWABLE STANDARD OFFER AND SOLAR SOLUTIONS INITIATIVE

## 49 Projects to Date = 104.1 MW (DC) Operating

Another 34 project applications, representing about 142.5 MW (DC) of additional power, were either received or approved by TVA and were in various stages of construction as of Sept. 30, 2016.

Of these totals, 37 projects (25 MW (DC)) were operating under the Solar Solutions Initiative, with another 23 projects (22 MW (DC)) at various stages of construction as of Sept. 30, 2016.

RESOURCE	OPERATING MW – DC NAMEPLATE
Solar	66.5
Biomass	20.0
Landfill Gas	17.6
<b>Total</b>	<b>104.1</b>





# DISTRIBUTED SOLAR SOLUTIONS

Distributed Solar Solutions is a pilot program launched in 2016 designed to encourage renewable projects led by our local power company partners. Initial projects explore solutions to Community Solar, targeted deployment on distribution circuits to provide technical benefits, and solar deployment in a micro-grid.

16.7 MW

CAPACITY AWARDED (DC)

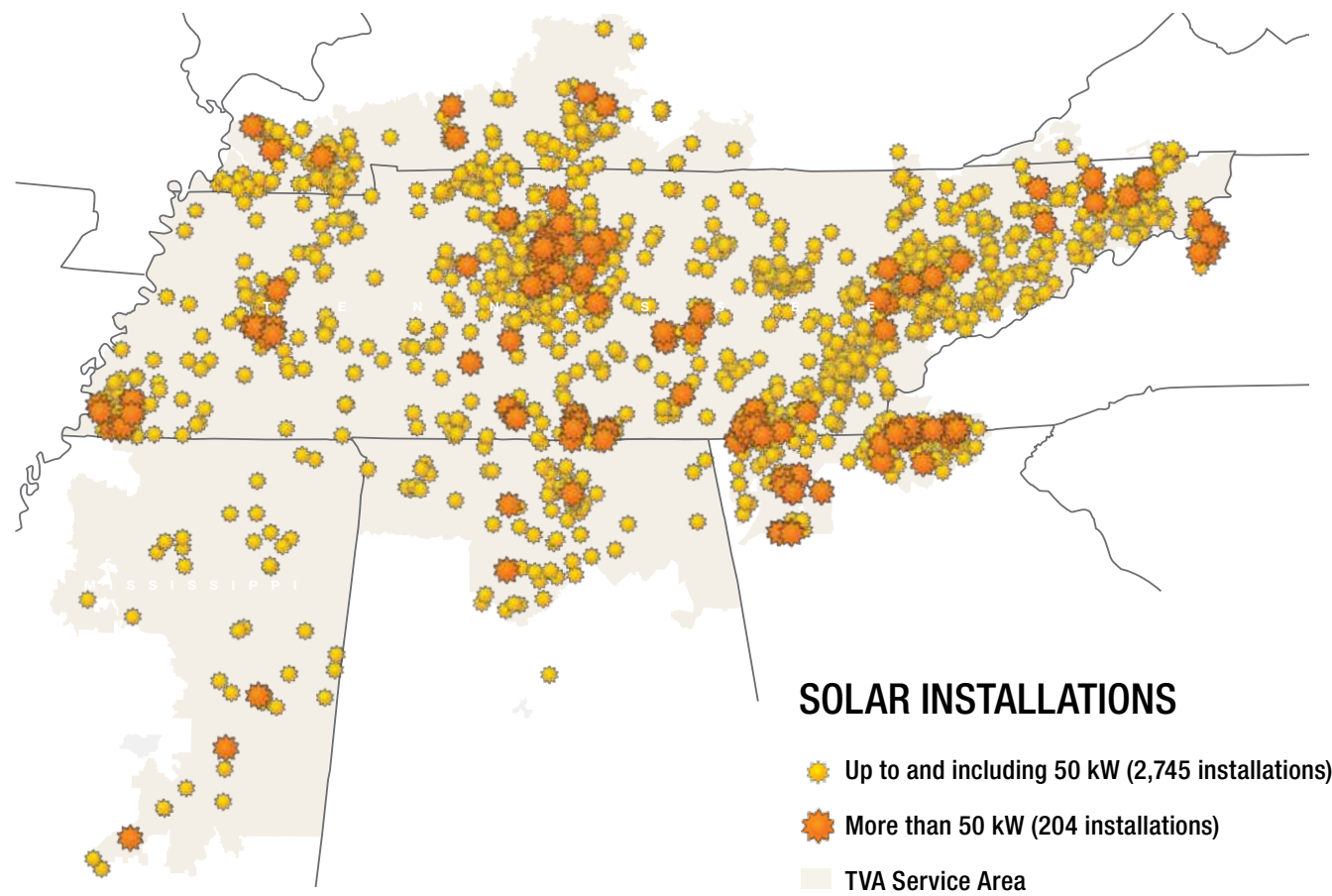
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PROJECTS PROGRAM-TO-DATE





# OPERATING SOLAR INSTALLATIONS







# APPENDIX

For a complete list of activities by power company, [click here](#).

- LPC Top Performers
- Top Performers by Program
- Description of Programs



# LPC TOP PERFORMERS

TOTAL PROGRAM SAVINGS	TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL
	Memphis Light, Gas & Water Division	31,035,474	11.05%
	Nashville Electric Service	20,413,541	7.27%
	Middle Tennessee Electric Membership Corporation	16,550,604	5.89%
	Knoxville Utilities Board	12,428,100	4.42%
	Electric Power Board of Chattanooga	12,408,368	4.42%
	Huntsville Utilities	11,646,252	4.15%
	Murfreesboro Electric Department	11,273,341	4.01%
	Joe Wheeler Electric Membership Corporation	5,462,004	1.94%
	Volunteer Energy Cooperative	5,201,433	1.85%
	Warren Rural Electric Cooperative Corporation	4,828,492	1.72%
	Program Total	280,888,173	

SAVINGS TO SALES	TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY SALES TOTAL
	Hickman Electric Plant Board	357,897	1.84%
	Water Valley Electric Department, City of	925,662	1.27%
	Fulton Electric System	714,098	1.24%
	Courtland Electric Department	149,700	0.73%
	Alcorn County Electric Power Association	4,401,274	0.70%
	Marshall-DeKalb Electric Cooperative	3,134,051	0.69%
	Trenton Light & Water Department	480,590	0.68%
	Murfreesboro Electric Department	11,273,341	0.63%
	Glasgow Electric Plant Board	1,834,712	0.61%
	Hartselle Utilities	825,840	0.54%
	Program Total	280,888,173	0.21%





# TOP PERFORMERS BY PROGRAM

## eSCORE

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Middle Tennessee Electric Membership Corporation	1,978,130	7%	453	9%	1,972	0.06%
Nashville Electric Service	1,942,765	7%	310	6%	2,502	0.04%
Electric Power Board of Chattanooga	1,763,614	7%	403	8%	1,945	0.08%
Volunteer Energy Cooperative	1,302,955	5%	210	4%	796	0.09%
Appalachian Electric Cooperative	1,183,285	4%	209	4%	697	0.20%
Program Total	26,840,076		4,978		23,884	

## eSCORE SELF AUDIT PROGRAM

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Memphis Light, Gas & Water Division	1,013,077	10%	359	15%	1,411	0.02%
Electric Power Board of Chattanooga	928,928	9%	217	9%	1,276	0.04%
Nashville Electric Service	720,720	7%	168	7%	990	0.02%
Knoxville Utilities Board	687,960	7%	161	7%	945	0.03%
Appalachian Electric Cooperative	489,216	5%	114	5%	672	0.08%
Program Total	9,867,741		2,427		13,574	

## HEAT PUMP PROGRAM

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Blue Ridge Mountain Electric Membership Corporation	399,154	10%	95.2	9%	238	0.10%
Sevier County Electric System	371,070	9%	95.0	9%	190	0.07%
North Georgia Electric Membership Corporation	298,809	7%	76.5	7%	153	0.02%
Joe Wheeler Electric Membership Corporation	261,702	6%	67.0	7%	134	0.05%
Scottsboro Electric Power Board	198,814	5%	50.7	5%	103	0.21%
Program Total	4,052,818		1,029		2,116	

## NEW HOMES PROGRAM

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Huntsville Utilities	4,248,703	51%	1,028	53%	936	0.18%
Electric Power Board of Chattanooga	489,175	6%	110	6%	204	0.02%
City of Florence Electricity Department	484,140	6%	115	6%	170	0.08%
Middle Tennessee Electric Membership Corporation	268,686	3%	65	3%	59	0.01%
Sevier County Electric System	232,254	3%	56	3%	51	0.05%
Program Total	8,292,162		1,952		2,346	

## VOLUME HEAT PUMP PROGRAM FOR MANUFACTURED HOMES

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Volunteer Energy Cooperative	521,365	6%	-	-	169	0.04%
Knoxville Utilities Board	379,455	4%	-	-	123	0.02%
Appalachian Electric Cooperative	274,565	3%	-	-	89	0.05%
Tombigbee Electric Power Association	225,205	3%	-	-	73	0.04%
Holston Electric Cooperative	209,780	2%	-	-	68	0.06%
Program Total	8,434,390		-	-	2,734	

## ENERGYRIGHT SOLUTIONS FOR BUSINESS

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Memphis Light, Gas & Water Division	26,015,925	17%	3,724	17%	414	0.41%
Nashville Electric Service	14,309,348	9%	1,945	9%	130	0.24%
Middle Tennessee Electric Membership Corporation	12,249,955	8%	1,486	7%	101	0.58%
Murfreesboro Electric Department	10,591,839	7%	1,152	5%	44	1.36%
Knoxville Utilities Board	8,322,856	5%	1,122	5%	160	0.36%
Program Total	152,420,305		22,102		2,189	



# TOP PERFORMERS BY PROGRAM

## ENERGYRIGHT SOLUTIONS FOR INDUSTRY

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Electric Power Board of Chattanooga	3,992,977	9%	482	9%	9	0.44%
Alcorn County Electric Power Association	3,324,959	8%	398	7%	1	1.56%
Memphis Light, Gas & Water Division	3,002,125	7%	402	7%	13	0.15%
Warren Rural Electric Cooperative Corporation	2,544,906	6%	299	6%	6	0.36%
Nashville Electric Service	1,826,971	4%	251	5%	11	0.17%
Program Total	114,285,279		5,380		158	

## ENERGYRIGHT SOLUTIONS FOR CUSTOMER SYSTEMS

TOP LOCAL POWER COMPANY PERFORMERS	KWH	% OF FY PROGRAM TOTAL	KW	% OF FY PROGRAM TOTAL	TOTAL PARTICIPANTS	% OF SAVINGS VS SALES
Franklin Electric Plant Board	129,600	N/A	3,240	N/A	1	0.06%
Loudon Utilities	79,200	N/A	1,980	N/A	1	0.01%
Upper Cumberland Electric Membership Corporation	49,800	N/A	1,245	N/A	11	0.00%
Greeneville Light & Power System	45,400	N/A	1,135	N/A	-	0.00%
Aberdeen Electric Department	35,000	N/A	875	N/A	-	0.02%
Program Total	(917,800)		(22,945)		(40)	

All rankings are based on energy savings with the exception of demand response, which is based on demand reduction.

## GREEN POWER SWITCH

TOP LOCAL POWER COMPANY PERFORMERS	GPSMWH SOLD	% OF FY PROGRAM TOTAL
Nashville Electric Service	10,415	15.12%
Knoxville Utilities Board	9,382	13.62%
Memphis Light, Gas & Water Division	7,551	10.96%
Murfreesboro Electric Department	6,078	8.82%
Huntsville Utilities	4,467	6.48%
Program Total	68,886	

GPS ranking is based on MWh sold in FY 16.

## GREEN POWER PROVIDERS

TOP LOCAL POWER COMPANY PERFORMERS	OPERATING MW - DC NAMEPLATE CAPACITY	% OF TOTAL CAPACITY
Blue Ridge Mountain Electric Membership Corporation	15.00	14.99%
Nashville Electric Service	5.68	5.67%
Fayetteville Public Utilities	5.67	5.67%
Middle Tennessee Electric Membership Corporation	4.91	4.91%
North Georgia Electric Membership Corporation	4.83	4.83%
Program Total	100.05	

GPP ranking is based on operating MW- DC nameplate capacity program to date.



# DESCRIPTION OF PROGRAMS

## ENERGYRIGHT SOLUTIONS FOR THE HOME

### eScore™ Program

eScore is an energy efficiency home improvement offer from TVA. The design of the program is to provide homeowners a simple path to making their home a “10” – its most energy efficient.

### eScore™ Self Audit Program

TVA’s do-it-yourself online audit helps homeowners take charge of saving energy from the comfort of their personal computer. With upgrade and behavioral suggestions, current product offers and an energy savings kit, using less is simpler than ever.

### Heat Pump Program

Valley residents have been benefiting from TVA’s heating and cooling upgrade assistance for decades. Our Quality Contractor Network provides expert installation of energy efficient heat pumps to ensure high performance and customer satisfaction.

### New Homes Program

TVA is encouraging the development of new, all-electric homes across the Valley. Homes built above code qualify as EnergyRight® Platinum or Platinum Certified (RESNET or ENERGY STAR® Certified). Buying a new, energy efficient home means savings from day 1.

### Manufactured Homes Programs

TVA’s Manufactured Homes programs are reducing energy consumption in the Valley by incentivizing wholesalers to install electric heat pumps at point of sale and manufacturers to produce ENERGY STAR® Manufactured Homes for even greater efficiency. An energy efficient manufactured home saves energy and money right from the start.

## ENERGYRIGHT SOLUTIONS FOR BUSINESS

TVA helps businesses become more energy efficient by providing assessments of energy use and incentives for qualifying businesses that can reduce their electricity usage. The program helps save money in these areas: lighting, heating and cooling, and business equipment.

### Small Business Direct Install

This program, which focuses on interior lighting retrofits, offers a turnkey feature that provides an opportunity to reach small commercial customers who are unlikely to participate in other types of energy efficiency offers.

## ENERGYRIGHT SOLUTIONS FOR INDUSTRY

Customized TVA technical assistance is available to industrial users of power to devise plantwide, holistic approaches to energy savings. TVA helps

customers maximize efficiency, control expenses and boost their bottom lines. In addition, program participants may be eligible for financial incentives to implement energy-saving changes in their operations and plant.

## RENEWABLE ENERGY SOLUTIONS

### Green Power Switch®

This program offers a simple way to support regional renewable energy. Each block of Green Power Switch ensures 150 kilowatt-hours of electricity is generated by a renewable resource such as wind, solar or biomass.

### Green Power Providers<sup>SM</sup>

Green Power Providers (up to 50 kW) replaced the successful Generation Partners pilot program that was initiated in 2003. Green Power Providers implements industry best practices to continue helping add sustainable solar and renewable energy in the Tennessee Valley.

### Solar Solutions Initiative

This pilot program was sunset at the end of CY15. It was intended for solar projects in the Valley (> 50 kW up to 1 MW) that use local, NABCEP-certified installers, helping support regional jobs and investment. The program was open to consumers, developers and local power companies who wished to install mid-size solar

energy systems. The purchase price included a 10-year overlay to the base market prices offered in the Renewable Standard Offer.

### Renewable Standard Offer

This program was sunset at the end of CY15. It was intended for medium to larger renewable energy projects in the Valley (> 50 kW up to 20 MW). The program was open to consumers, developers and local power companies who wished to install mid- to large-size renewable energy systems. Eligible technologies included solar, wind and biomass energy.

### Distributed Solar Solutions

This pilot program began in 2016 and replaced the Solar Solutions Initiative pilot. Distributed Solar Solutions is designed to encourage renewable energy projects that are directed by our local power company partners. By working at a local level, distributed energy solutions can be implemented that help move renewables closer to the end-use customer. In FY16 projects could range in size from greater than 50kW up to 5 MW of solar electricity.

# DESCRIPTION OF PROGRAMS

## ENERGYRIGHT SOLUTIONS FOR CUSTOMER SYSTEMS

### Commercial and Industrial Direct Load Control

A demand reduction program aimed at commercial and industrial customers that is available for dispatch up to 40 hours per year to mitigate high wholesale power prices, and allows unlimited hours for reliability calls. Program events are dispatched and monitored via near-real-time monitoring software. As an incentive, customers receive monthly capacity payments and energy payments based on performance during events. Current third party implementer is EnerNOC.

### Conservation Voltage Regulation (CVR)

This program uses conservation voltage regulation (CVR) with local power companies to achieve energy savings by optimizing voltage levels along electric system distribution feeders on an “always-on” basis. The program utilizes

a feeder voltage feedback loop to bias voltage regulators to maintain the lowest acceptable feeder voltage. Year-round energy savings occur from end-use devices operating more efficiently at designed voltage levels.

### Dispatchable Voltage Regulation (DVR)

A component of the Smart Grid Pilot demonstration project in which 16 local power companies optimize distribution-level voltage to reduce 183 MW of peak demand. Electric system distribution feeders utilize a voltage feedback loop to bias voltage regulators to maintain the lowest acceptable feeder voltage. DVR is dispatched economically for up to 100 hours annually with energy cost tied to the variable Henry Hub natural gas index.

### Residential Direct Load Control (DLC)

This program utilizes direct load control switches or devices to reduce 2.5 MW of peak demand from two local power companies. Two-way

communicating direct load control switches or devices (i.e., programmable communicating thermostats) connected to electric water heaters, air conditioners and pool pumps shut the device down during called peak events. DLC is dispatched economically for up to 100 hours annually with energy cost tied to the variable Henry Hub natural gas index.

### Aggregated Demand Response (ADR)

This program enables local power companies to aggregate and provide demand response load to TVA in a manner similar to the Commercial and Industrial DLC program. Under the current proof of concept pilot, demand reduction is available for dispatch up to 12 hours per year to mitigate high wholesale power prices, and allows unlimited hours for reliability calls. Program events are dispatched and monitored via near-real-time monitoring made available by local power companies and visible in the DR desk.





